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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,765	03/18/2004	John Grunwald	26223-10	6691

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EXAMINER
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PHAM, THANHHA S

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/803,765

Applicant(s)

GRUNWALD, JOHN

Examiner

Thanhha Pham

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 January 2005.  
 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-13 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☒ None of:  
 1. ☒ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 3/18/2004.  
 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) ☐ Notice of Informal Patent Application (PTO-152)  
 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

This Office Action is in response to Applicant's Amendment dated 01/20/2005.

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an applications filed in Israel on 06/23/2002, 07/03/2002 and 07/24/2002. It is noted, however, that applicant has not filed certified copies of the 150364, 150577, and 150940 applications as required by 35 U.S.C. 119(b).

### ***Oath/Declaration***

2. Oath/Declaration filed on 03/18/2004 has been considered.

### ***Specification***

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Specification should be corrected to include as usage of a borane reducing agent and the reducing solution includes at least one metal ion of group 1b of the periodic table as being supported in the original claims 5-6.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**4. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

► With respect to claim 1,

line 6, "the metal ions" lacking antecedent basis renders the claim indefinite. It is not clear that "the metal ions" refers to which metal ions – "non-precious metal ions" as cited on line 4 of claim 1 OR "at least one metal ion of group Ib of the periodic table" as cited in claim 6.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**5. Claims 1 and 5-6, as being best understood, are rejected under 35 U.S.C. 102(b) as being Feldstein by [US 4,328,266].**

***\*\*\*\*Notice: this rejection is based on interpreting the claim in a broad scope wherein steps (a) and (b) are performed spontaneously at the same time.***

► With respect to claim 1, Feldstein (cols. 1-10) discloses the claimed method of electrolessly depositing a metal on at least a part of a surface of a silicon wafer substrate comprising:

(a) contacting the silicon wafer substrate with a solution comprising non-precious metal ions (col. 2 lines 55-68, col. 3 lines 1-3 & 11-38, col. 9 lines 15-24: *when immersing/contacting the silicon wafer substrate in the promoter solution, the silicon wafer substrate is covered with non-precious metal ions of nickel or cobalt*) so as to obtain a wafer substrate covered with non-precious metal ions; and

(b) exposing the wafer substrate obtained in step (a) to a reducing solution comprising a reducing agent for reducing the precious metal ions that cover said wafer substrate to a lower oxidation state (col. 2 lines 55-68, col. 3 lines 1-3 & 11-38, col. 9 lines 15-24: *when immersing/contacting the silicon wafer substrate in the promoter solution, the silicon wafer substrate covered with non-precious metal ions of nickel or cobalt is exposed to the reducing solution in the promoter solution. When reducing agent reacts the non-precious metal ions of nickel or cobalt, the non-precious metal ions of nickel or cobalt are reduced to a lower oxidation state to provide catalytic sites for electroless deposition*)

► With respect to claim 5, Feldstein (col. 3 lines 55-67) discloses the reducing solution used in step (b) comprises a borane reducing agent.

► With respect to claim 6, Feldstein (col. 4 lines 48-59) discloses said reducing solution used in step (b) comprises at least one metal ion of group Ib (e.g gold or silver).

**6. Claims 1-2, 5, 7 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Nuzzi et al. [US 4,199,623].**

► With respect to claims 1-2, 7 and 11, Nuzzi et al (cols 1-13) discloses the claimed method of depositing a copper pattern on a silicon wafer substrate (glass, example 24) comprising steps of:

(a) contacting the silicon wafer substrate with a solution comprising non-precious metal ions (cuprous ion, example 24) so as to obtain the a wafer substrate covered with non-precious metal ions (col. 2 lines 53-63 and col. 3 lines 10-43);

(b) exposing the wafer substrate obtained in step (a) to a reducing solution comprising a reducing agent for reducing the precious metal ions that cover said wafer substrate to a lower oxidation state (example 24, col. 4 lines 25-43, col. 6 lines 10-28, col. 11 lines 35-39); and

(c) contacting the wafer substrate obtained in step (b) with an electroless copper plating solution (example 24, col. 11 lines 42-57).

► With respect to claim 5, Nuzzi et al. (col. 6 lines 10-28) discloses the reducing agent in step (b) comprises a borane reducing agent.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**7. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nuzzi et al. [US 4,199,623] or Feldstein [US 4,328,266] as applied to claim 1 or 2 above in view of Segawa et al. [US 6,638,564].**

Nuzzi et al. and Feldstein substantially disclose the claimed method except teaching using puddle processing to carry out at least one of steps (a), (b) and (c) to provide solutions to the wafer substrate.

Segawa et al. teaches using puddle process as an improved process to supply chemical solution to the wafer substrate for electroless deposition with less wasting chemical.

Therefore, at the time of invention, it would have been obvious for those skilled in the art to modify process of Nuzzi et al. or Feldstein by using the puddle processing as being claimed, per taught by Segawa et al., to improve process of electroless deposition with low production cost wherein wasting of chemical being reduced.

**8. Claims 8-10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nuzzi et al. [US 4,199,623] or Feldstein [US 4,328,266] as applied to claim 1, 2 and 11 above in view of Imura et al. [US 4,659,587].**

Nuzzi et al. and Feldstein disclose the claimed method except teaching scanning the wafer substrate with laser radiation during or after step (b) [*claims 8, 9 and 12*] or during or after step (c) [*claims 10 and 13*] in predetermined manner.

However, Imura et al teaches scanning the wafer substrate with laser radiation for selective activation the wafer substrate for electroless deposition.

Therefore, at the time of invention, it would have been obvious for those skilled in the art to modify process of Nuzzi et al. or Feldstein by selectively scanning the wafer substrate with laser radiation as being claimed, per taught by Imura et al, to provide a

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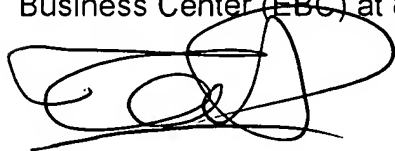
better control and efficiently electroless depositing metal of copper on the wafer substrate.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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